



Monitoring Program

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Problem Definition

The Puget Sound Water Quality Action Team and Puget Sound Council require information about the condition of the Puget Sound environment to evaluate progress towards meeting the *Puget Sound Management Plan's* goals. The information is also needed to identify problems that might require new or amended protection or restoration efforts.

To appropriately characterize Puget Sound and human interactions with the ecosystem, a great diversity of scientific information is required, and consistent measurements are needed over time to provide information on trends and other changes in conditions.

The Monitoring Program is designed to efficiently gather and communicate information from a broad array of scientific disciplines utilizing the expertise of multiple state and federal agencies, local governments and citizens.

efforts to coordinate citizens' and pesticide monitoring. Each of these elements is designed to coordinate existing data collection efforts and to build networks and systems that address the monitoring needs of Puget Sound decision-makers.

The PSAMP is a coordinated, interagency effort to collect, assess and communicate information on baseline conditions and trends in Puget Sound. The PSAMP develops reports on the status and trends of conditions related to the "health" of Puget Sound, including water and sediment quality; fish contamination and its effects; fish, bird and harbor seal abundance; and nearshore habitat quality. The studies are conducted by the departments of Ecology, Fish and Wildlife, Health and Natural Resources; U.S. Fish and Wildlife Service; and the King County Department of Natural Resources. They're built upon a set of studies that these agencies could conduct, or were conducting, to meet their own mandates and to make use of their various areas of expertise.

Institutional framework

The Monitoring Program is built around the Puget Sound Ambient Monitoring Program (PSAMP) and

Action Team support staff work with scientists and managers representing the agencies that conduct PSAMP monitoring, the Environmental Protection Agency (EPA) and the National Marine

What does "shall" mean?

The Action Team has determined that the actions in this plan are needed to protect and restore Puget Sound. Consistent with the importance of these actions, this plan says that appropriate implementers "shall" perform the actions. However, implementation of many of these actions is a long-term process. The Action Team's work plans will identify the actions that need to be taken each biennium to implement this management plan. Implementation of actions in the work plans is subject to the availability of funds and public input into the decision-making processes of implementing entities. When an action is included in a biennial work plan, the Action Team expects that it will be implemented in accordance with the relevant provisions of the Puget Sound management plan, in accordance with Chapter 90.71 RCW.

Fisheries Service to coordinate the PSAMP's studies and to communicate their findings to decision-makers and the public.

With its focus on monitoring ambient conditions in the Puget Sound environment, the Monitoring Program provides one facet of information needed for adaptive management. As described in this Estuary Management Program, the management direction set forward in this management plan and in the *Puget Sound Water Quality Work Plan* are based in part on results of selected environmental indicators and long-term monitoring. Adaptive management of this management plan's many programs is achieved through program-specific evaluation. Program evaluation relies on environmental monitoring data provided through the Monitoring Program. It also requires information about the implementation of the program and the effectiveness of program actions and strategies.

Program Goal

To assess the health of Puget Sound and its resources and to communicate information on Puget Sound's conditions in order to promote informed choices for the environmental management of Puget Sound.

Program Strategy

The strategy for achieving this goal is to: (1) implement the Puget Sound Ambient Monitoring Program; (2) develop a citizens' monitoring program; and (3) coordinate pesticide monitoring activities in Puget Sound.

M-1. Puget Sound Ambient Monitoring Program

The Puget Sound Ambient Monitoring Program (PSAMP) conducts long-term monitoring and coordinates the dissemination of information about the condition of Puget Sound. The goals of the PSAMP are to:

- a. Assess the health of Puget Sound and its resources and document geographic patterns in the condition of the Sound and its resources.
- b. Document natural and human caused changes over time in the ecological compo-

nents of Puget Sound.

- c. Through ongoing monitoring programs, identify existing, emerging or anticipated environmental problems and, where possible, identify the reasons for these problems.
- d. Provide data and other information to assist the Puget Sound Action Team and others in measuring the success of environmental programs.
- e. Support research activities by making available scientifically valid data.

M-1.1. PSAMP Management Structure

The PSAMP is a complex interagency program, requiring coordination among many parties.

The Puget Sound Water Quality Action Team defines the direction, scope and design of the PSAMP, considering recommendations from PSAMP committees, Action Team support staff and others.

Action Team support staff shall include a PSAMP Science Coordinator who serves as an interdisciplinary and inter-program science advocate, interpreter, representative and convener. The coordinator chairs the PSAMP Steering Committee and provides staff support to the PSAMP Management Committee.

The PSAMP is implemented through monitoring tasks performed by state, federal and local agencies and coordinated by interagency committees.

The Management Committee directs and oversees program planning, budgeting, staffing, implementation, data management, external relations and evaluation, and ensures that the PSAMP draws from PSAMP and non-PSAMP data to develop a comprehensive picture of Puget Sound ambient conditions.

The Steering Committee coordinates planning and implementation of monitoring components and topics, and collaborates with the Management Committee and Topic Groups on program design and implementation. The committee includes principal investigators of PSAMP's monitoring components and other members appointed by the Action Team Chair. The committee is chaired by the PSAMP Science Coordinator.

Topic Groups determine how to answer integrated monitoring questions derived from PSAMP's conceptual model and relate to general monitoring

topics, such as toxics, nutrients, fecal bacteria, habitat, etc. The groups include PSAMP principal investigators and other scientists and are chaired by Steering Committee members.

M-1.2. PSAMP Coordination Activities

The PSAMP Science Coordinator and PSAMP committees shall:

- a. Review the PSAMP's goals and recommend changes to the Council and Action Team;
- b. Develop, review and revise a conceptual model that describes the cause-and-effect links between human activity and anticipated environmental change;
- c. Develop, review and revise integrated monitoring questions that are derived from the PSAMP's conceptual model;
- d. Convene regional scientists as "Topic Groups" to develop and maintain interdisciplinary topic plans that describe how sampling activities from one or more monitoring tasks will answer the integrated questions for each topic;
- e. Prepare topic reports and a biennial *Puget Sound Update* that integrates and summarizes program findings and findings from related non-PSAMP studies;
- f. Maintain a meta-database inventory of non-PSAMP data for use by PSAMP and outside investigators;
- g. Convene annual PSAMP Science meetings and biennial reviews to present and review program findings, discuss progress on biennial work plans, and invite comments on the program from interested parties;
- h. Recommend to the Council and Action Team priority enhancements or adjustments for the next biennial work plan; and
- i. Share Puget Sound scientific information by: promoting external use of PSAMP data and acquire non-PSAMP data; obtaining independent scientific advice and peer review of products; coordinating with related monitoring programs; and keeping the public informed about the condition of Puget Sound.
- j. Evaluate the gaps in the breadth of monitoring activities, in terms of species or habitats covered, and temporal continuity.
- k. Coordinate inventories of wetlands, flood

plains, intact riparian areas and marine nearshore habitats as described in Element MFH-4.1d of this plan.

Roles and responsibilities for the implementation and coordination of the PSAMP shall be more fully specified in a program description document.

Principal investigators of PSAMP monitoring components shall:

- a. Prepare implementation plans that define the field activities and the procedures and measures for quality assurance and quality control;
- b. Implement monitoring activities;
- c. Manage data generated with PSAMP funding to:
 - i. address the needs of the users,
 - ii. facilitate efficient sharing of data, including easy, low-cost access for other interested parties, and
 - iii. completely and unambiguously archive data and allow for long-term retrieval;
- d. Prepare reports on sampling activity and monitoring results; and
- e. Invite non-PSAMP scientists to participate in peer review of implementation plans and task reports.

M-2. Citizens' Monitoring

The Puget Sound Action Team shall develop a citizens' monitoring program to collect data that supplements information provided by the PSAMP and to act as an educational and public involvement tool. At least one citizens' monitoring project shall be carried out each year.

Citizen monitors shall be asked to carry out monitoring activities deemed appropriate by Action Team support staff in consultation with the PSAMP Steering Committee and/or staff of local governments, state agencies and tribal governments. Staff from Action Team agencies shall provide technical support and oversight for citizens' monitoring projects funded under this element. Action Team staff shall provide volunteer-management support for citizens' monitoring projects funded under this element.

Data collected under citizens' monitoring programs shall be subject to appropriate protocols and quality assurance checks. To the extent possible, citizens' monitoring efforts should follow Puget

Sound Protocols and Guidelines. If necessary, citizens' monitoring protocols should be developed to describe appropriate and acceptable approaches to data collection.

M-3. Pesticides Monitoring

The Action Team support staff will convene a technical committee, consisting of representatives with expertise in pesticides from: the departments of Ecology, Health, Fish and Wildlife, Agriculture, Transportation and Natural Resources; the University of Washington, Washington State University and Western Washington University research faculty; the Environmental Protection Agency (EPA); the U.S. Geological Survey; the U.S. Fish and Wildlife Service; the National Oceanographic and Atmospheric Administration; the Natural Resources Conservation Service; conservation districts; public and private interests; and other organizations. The technical committee will (1) coordinate and focus ongoing pesticides monitoring activities in Puget Sound; (2) evaluate the need for additional monitoring of pesticides in Puget Sound; and (3) make recommendations to the Action Team for the inclusion of pesticides monitoring in selected tasks of the PSAMP and other ongoing monitoring efforts.

Some pesticides monitoring needs that the technical committee should consider include:

- a. The monitoring of potential point and non-point sources of pesticides including sewer and storm drain out-falls and highway, forestry and agricultural runoff.
- b. The monitoring of ambient levels of pesticides in Puget Sound sediments and organisms to determine long-term changes in environmental concentrations.

Target Dates for M-3: The technical committee shall be convened by January 2002, and shall make recommendations on pesticides monitoring to the Action Team by November 2002.